

## RESEARCH ARTICLE

# An Experimental Investigation on Dew Drain Water for Drinking Purpose

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### ABSTRACT

Now a day the drinking water quantity is day by day going down due to some environmental conditions or climatic changes and water scarcity. The groundwater level also decreased in the summer season in comparing to other weather conditions. Generally, the water demand per day is 133per capita. In desert regions or low groundwater level areas the water consumption is very low and usage is also reduced. Minimizing water problems recycled water is used for plantation, garden works, construction work; etc., So this reason the water saving is important and innovation is needed for the usage of water for any purpose, mainly needed to drinking. This project deals with the dew drain water analysis for drinking purposes. The characteristics of dew drain water match the natural water as per BIS.

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### Introduction

Groundwater level low area or deserts region receives precipitation in the range of 250 mm per annual. Here the peoples are suffering from water for receiving the annual rainfall of 100 mm to 200 mm; this amount of rain is not enough for running their life. Water disappears in the air, which is called humidity, it changes from liquid state to gas state from oceans, rivers, and other sources of water, and water vapor in the trees or plants leaves via a done process of transpiration.

Water or stream is another form of existence like dew, this will appear in a small droplet at night. During night time the air it cools, the dew form into the small water droplet. This water is collected in a small tray with help of a transparent sheet covered in the one feet size pit. Before daylight temperature increasing the dew drain water is collected and stored at normal temperature for 7 days only. This project deals; we construction of a dew trap to collect the water and this trap or tray not strictly collected dew; the water is cool down on the inside of the tray. The tray was placed on 1-foot dig holes.

### Scope of the Project

- Selection of area for construction of dew drain.
- Formation of dew drain pit by means of mandrel.
- Collection of vaporized water in a tray.
- Analyzing the characteristics of dew drain water.
- Overview on various aspects on environmental engineering.
- Plantation of samplings in three separate pan trays.
- Watering of tray pans with normal, recycled and distilled water.
- Examining the plant growth at regular intervals.
- Graphical representation of plant growth.
- Comparison of the results.

### Need of the Study

To sustain fine fitness and right body condition, the quantity of water in the living thing body should keep constantly. So, the quantity of water reduces day to day essential be change by an equivalent quantity of every day

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water drinking to maintain the proper equilibrium. Water is taken in three types:

- The water level in food is 0.7 l.
- During bio chemical activity the water is:0.3 l
- In Drinking purpose: 1.5 liters additionally taken.

## Characteristics of Water

### A. Physical Characteristics

Physical tests of water are carried out in classify to determine the physical properties of water. It includes tests for determining turbidity value, color, feel or tastes or odor, high temperature.

### B. Chemical Properties

During Chemical tests of water is taken in range to find the chemical properties of water. It includes tests for determining the available Solids quantity, pH amount, hardness of water and available chlorine value.

### Site Selection

The required size of collecting of dew sample is 1 sq. ft. with 25 holes, which is opened on two sides. This opening is covered in a transparent sheet and it holds the cool dew droplet. The tray was placed under the hole and dew water is collected. The water sample is collected at seven days once with capacity of 1 to 2 liters. This collected water was stored and physically aborted temperature & color of water sample.



Fig. 1. Collection of dew drain water

## Laboratory Test and Analysis of Dew Drain Water

### a. Turbidity

The turbidity of water depending on the finesse & concentrated of particles is present in the normal water. Clay matter or different balanced particles may possibly not be unsafe to physical condition, but removing and reducing for visual and psychosomatic reason. The permissible limit of turbidity value is 5 to 10 units of for drinking water. Here Nephelometric turbidity units based, test prefers turbidity value of a given concentrated of formalize has been an approximate turbidity value is one hundred (100) NTU. The turbidity of dew water is 0.8 NTU.

### b. Color property

The occurrence of colour in normal water is cannot disagreeable from fitness point. But psychosomatic view, as human might not like to swig colored or polluted due to rain waters. The colour in water can be easily found by the exposed eye. The maximum permissible colour for domestic water is 20 ppm (**parts per million**). For public water supply, color number on blue scale must not reach 20, and be supposed to preferably be a smaller amount of 10.

### c. Tastes and Odours

For community supply, the water must be free from odor. Potable waters, temperature of about 10<sup>0</sup> C are highly desirable, while temperature above 25<sup>0</sup> C are considered objectionable.

### d. Total Solids

The entire amount of solids is addition of suspended solids and dissolved matters there in drinking water it can be found by evaporate a sample of normal water and weighted the dry rest of solids was left. The suspended matters must be viewed by filter the dew sample and weighted the rest of solids left on the filtering & the differentiation between the total solid and suspended solid gives the dissolved solid value.

Generally total allowable amount of solids in drinking water is restricted to 500 ppm, even though high amounts up to 1000 ppm, are also sometimes allowed, but are likely to make certain psychological effects on human system.

The quantity of Total solids present in the dew water=98mg/l

The quantity of suspended solids present in the dew water=46 mg/l

The quantity of dissolved solids present in the dew water= 42mg/l

### e. pH Value of Water

The pH amount of drinking water defines the log values of reciprocal of H ion concentrated available in drinking water. It may indicate the water is acidity or alkalinity.

Public drinking water supplies to keeping the pH value close to 7. As per BIS suggest the range between 6.6 to 8.5.

Here the pH value of dew drain water is 6.8.

**f. Hardness of Water**

The Hardness of drinking water is defined which it prevent the construction of enough leather or bubble, when some hard waters are assorted with soap. It is generally affected by the available of calcium (cl) and magnesium (mg) salt presence in the drinking water, which type foam by react with soap.

The amount of Total hardness present in the given dew drain water is 2.7 mg/l.

**g. Chloride Content**

The available chlorides (cl<sub>2</sub>) are in drinking water in the formation of NaCl<sub>2</sub> and it might be present due to: leakage of sea sedimentation deposit and polluted water from industrial and commercial or household etc. This concentration can be larger than 250 mg/l gives a in plain sight salty taste in drinking or normal water and this is horrible.

The present Cl<sub>2</sub> value of water may be calculated by titrate process, the drinking water with normal silver nitrate solution and potassium chromate as used for indicator point. The treated chloride presented water to be supplied to commercial should not go beyond a limit of 250 ppm.

Amount of Chlorides present in the dew drain water is 19.4 mg/l.

**h. Dissolved Gases**

The simple test which can be performed to determine this oxygen deficiency in water is to mix the water sample with 10% acid solution of potassium permanganate and to expose the mixture to atmosphere for 4 hours at 27<sup>0</sup> C. the quantity of oxygen absorbed can then be calculated by titration. This amount for potable water should be between 5 to 10 ppm. Hence the Bio chemical oxygen demand of safe drinking water must be absent or nil.

The quantity of DO available in the dew drain water = 7.34mg/l.

**Result**

**Table 1.** Permissible limits of water as per BIS

S. No	Tests	Test Values	IS: 10500 Requirement (Desirable limit)
<b>Essential Characteristics</b>			
1.	pH	6.8	6.5 - 8.5
2.	Turbidity, NTU, Max	0.8	5
<b>Following Results are expressed in mg/1:</b>			
3.	Total hardness as CaCO <sub>3</sub> , Max	27	300
4.	Chlorides as Cl, Max	19.4	250
<b>Desirable Characteristics</b>			
5.	Dissolved solids, Max	42	500
6.	Sulphate as SO <sub>4</sub> Max	308	200
7.	Alkalinity, Max	38	200
8.	Dissolved Oxygen	7.34	9

The above table relates the characteristics of dew drain water with Indian standard drinking water limits.

Here result value of all parameters should lie between the permissible values.

This project gives solution for new natural drinking water purpose and reduce water scarcity in desert or ground water level low areas.

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